

PATENT ABSTRACTS OF JAPAN

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(54) PRINT HEAD MAINTENANCE MECHANISM

(57)Abstract:

PROBLEM TO BE SOLVED: To reduce the cost and size by forming a wiper part and a cap part integrally of an elastic member, abutting them against the elastic member when an ink cartridge is moved and deforming both parts to be displaced thereby simplifying the parts and mechanisms for wiping and capping.

SOLUTION: A wiper part 14 is formed on the side opposite to a leg part 16 extending perpendicularly to the moving direction of an ink cartridge while a cap 15 is formed between them and they are shaped integrally by means of an elastic member 8, e.g. a rubber. The wiper part 14 comprises first and second wiper parts 141, 142 having knife edge parts 141a, 142a while the cap 15 is provided with a recess 19 having side walls 17, 18 and a protrusion piece 20 is formed integrally while facing the wiper part 141. The member 8 is deformed when the wiper part 141 moves further after abutting against the cartridge at a home position upon completion of printing. The head is thereby contained in the recess 19 and capped and when the wiper part 141 moves further, the head slides on the wiper part 141 a to perform wiping.

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**CLAIMS**

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[Claim(s)]

[Claim 1] It is prepared in the recording device of the ink jet method which prints by injecting the ink in an ink cartridge on a record medium from a print head. It is the print head maintenance device in which wiping and capping of said print head are performed. The wiper section which performs said wiping, and the cap section which performs said capping are formed in one of an elastic member. When said ink cartridge carries out elastic deformation of the member concerned in contact with said elastic member at the time of the migration, the variation rate of said wiper section and the cap section is carried out. The print head maintenance device characterized by constituting so that said print head may be covered in said cap section, while cleaning said print head in said wiper section.

[Claim 2] Said elastic member is the print head maintenance device according to claim 1 in which it was made for said elastic member to bend at an abbreviation right angle near the root section of said leg and cap section, by having the leg prolonged to an abbreviation perpendicular direction to the migration direction of said ink cartridge,

forming said wiper section in this leg and opposite side, forming said cap section between said legs and wiper sections, and making said ink cartridge contact to said wiper section.

[Claim 3] It is the print head maintenance device according to claim 2 said wiper section consists of the 1st wiper section projected to the side to said leg, and this 1st wiper section and the 2nd wiper section projected in the opposite direction, said ink cartridge contacts said 1st wiper section at the time of migration in the 1st direction, and it was made to contact said 2nd wiper section at the time of migration in the 2nd direction.

[Claim 4] The print head maintenance device according to claim 2 or 3 in which said cap section has the hollow which contains said print head.

[Claim 5] The print head maintenance device according to claim 2 or 3 which made the point of said wiper section the knife-edge configuration.

[Claim 6] Said elastic member has the leg prolonged to an abbreviation perpendicular direction to the migration direction of said ink cartridge. The cap section of a core box is formed in one succeeding this leg, and a perimeter is surrounded by the wall and is carrying out opening of said cap section to the upper part. The print head maintenance device according to claim 1 in which said leg was made to carry out elastic deformation by being formed as the wiper section to which the upper limit side of said wall \*\*\*\*\* said print head, and making said ink cartridge contact to said cap section.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the print head maintenance device prepared in the recording device of the ink jet method which prints by injecting the ink in an ink cartridge on a record medium from a print head.

[0002]

[Description of the Prior Art] Making a recording head scan to record media, such as paper, the recording device of an ink jet method makes ink breathe out from the nozzle prepared in the head, and records on a record medium.

[0003] In such a recording device, when ink is made to breathe out from a head, the droplet of ink etc. adheres to a nozzle and \*\*\*\*\* arises in the nozzle section. Moreover, moisture may evaporate from the ink adhering to a record medium in process of printing, the perimeter of a head may become highly humid, and dew condensation may be produced in an ink regurgitation side depending on temperature conditions.

[0004] Thus, if it gets wet in a regurgitation side and \*\*\*\*\* arises, the defect of

printing image quality will be invited to a regurgitation side -- an ink droplet etc. adheres to an ununiformity, ink serves as non-regurgitation by adhesion of the paper powder to a regurgitation side, or an ink discharge direction serves as a defect. Then, in order to prevent this, generally making the wiper which consists of elastic members, such as rubber, \*\*\*\* to the regurgitation side of a head, and cleaning a head is performed. This actuation is called wiping.

[0005] On the other hand, in the condition of not using the recording device, if a print head is left in air, the regurgitation will serve as a defect by thickening and solidification of the ink in a nozzle. Then, the ink regurgitation side of a print head is covered by the cap member at the time of un-printing, and, generally preventing desiccation of a nozzle is performed. This actuation is called capping.

[0006] The device for performing the above wiping and capping is called the print head maintenance device. The ink jet printer equipped with such a print head maintenance device is indicated by JP,3-281255,A, JP,3-290259,A, JP,4-307257,A, JP,8-267770,A, JP,9-150522,A, etc.

[0007] Drawing 8 is the perspective view showing an example of the ink jet printer equipped with the conventional print head maintenance device. In drawing, an ink jet printer 1 is equipped with the ink carriage 2 in which linear round trip migration is possible, and the ink cartridge 4 which has print head 4a in the lower part is held at this ink carriage 2. An ink cartridge 4 is the process moved by the ink carriage 2, and prints by injecting ink from print head 4a on the print sheet 3 which is a record medium.

[0008] the guide shaft 5 and guide plate (illustration abbreviation) which were constructed between the chassis side plates which do not illustrate the ink carriage 2 -- a linear round trip -- it is held movable and a both-way drive is carried out in the drawing Nakaya mark direction with the driving belt 6 with a gear tooth at the time of printing, 7 is a motor and transmits the driving force of this motor 7 to the ink carriage 2 through the driving belt 6 with a gear tooth.

[0009] In addition, the platen roller which a rotation drive is carried out and conveys a print sheet 3 by the motor which is not illustrated as a conveyance device of a print sheet 3 (illustration abbreviation), The tension roller of the follower which is prepared free [ attachment and detachment ] on a platen roller, and assists conveyance of a print sheet 3 on both sides of a print sheet 3 between platen rollers (illustration abbreviation), It is prepared free [ attachment and detachment ] on the delivery roller (illustration abbreviation) which delivers paper to a print sheet 3 by carrying out a rotation drive by the motor which is not illustrated, and a delivery roller, and a print sheet 3 is inserted between delivery rollers. The delivery tension roller (illustration abbreviation) of the follower which assists the delivery of a print sheet 3 is formed. It is built over these platen rollers, a tension roller, a delivery roller, and a delivery tension roller between chassis side plates, and they are supported free [ rotation ].

[0010] M is a print head maintenance device and is equipped with the base 9 used as a

holddown member, the cap 10 held at the cap holder 11, and the wiper 12 held at the wiper holder 13.

[0011] A wiper 12 consists of elastic members, such as rubber, and as shown in drawing 9, the point 12a is formed broadly. Moreover, cap 10 also consists of elastic members, such as rubber, and it is formed in the configuration of a core box as shown in drawing 10. This cap 10 is perpendicularly movable to the cap holder 112 made of resin by Spring S while being fixed to the cap holder 111 of the shape of a cylinder made of resin.

[0012] In the above ink jet printers, after print head 4a finishes printing to the printing side of a print sheet 3, a print sheet 3 is discharged out of a printer 1 with a delivery roller etc., and the ink carriage 2 starts the import actuation to the cap location which is a home position. That is, after printing actuation is completed, the ink carriage 2 which laid the ink cartridge 4 moves rightward [ of drawing 8 ] with the synchronous belt 6 driven by the motor 7, and print head 4a is conveyed to cap 10 and the location where it counters.

[0013] In this migration process, according to an operation of the cam mechanism which is interlocked with the ink carriage 2 and which is not illustrated, the wiper holder 13 moves upwards and point 12a of a wiper 12 is raised to a location [ a little ] higher than the field of print head 4a of an ink cartridge 4. Consequently, in case print head 4a passes through the location of a wiper 12, point 12a of a wiper 12 \*\*\*\*s to print head 4a strongly by the elastic force, and cleaning of print head 4a is performed by this.

[0014] Then, if the ink carriage 2 moves rightward further, the cap holder 11 will move upwards according to an operation of the above-mentioned cam mechanism, and if the ink carriage 2 comes to a termination location, i.e., a cap location, an ink cartridge 4 will be contacted so that cap 10 may cover and surround print head 4a. Capping is performed by this and dryness of print head 4a is prevented.

[0015] Drawing 11 shows typically actuation of wiping and capping which were mentioned above. As shown in this drawing (b), elastic deformation of the wiper 12 will be carried out, and if an ink cartridge 4 moves to the method of the right as shown in this drawing (a), and print head 4a contacts a wiper 12, as shown in this drawing (c), in slide contact with the inferior surface of tongue (ink regurgitation side) of print head 4a, wiping actuation will be performed for point 12a of a wiper 12 with passage of an ink cartridge 4. Then, if print head 4a of an ink cartridge 4 comes to a cap location, as shown in this drawing (d), cap 10 will move upwards, and in contact with an ink cartridge 4, capping actuation will be performed so that print head 4a may be covered and surrounded, as shown in this drawing (e).

[0016]

[Problem(s) to be Solved by the Invention] In the conventional ink jet printer mentioned above, since the wiper 12 and the cap 10 consist of another members, components mark increase and the problem that cost reduction is checked arises. Moreover, while the cam

mechanism for driving a wiper 12 and cap 10 in the vertical direction etc. was needed and promoting the cost rise conjointly with the increment in the above-mentioned components mark, it had become a failure also when equipment was miniaturized, since a complicated device was needed.

[0017] This invention cancels the above troubles, and while reducing cost by simplifying the components and device for wiping and capping, it is making to attain the miniaturization of equipment into the technical problem.

[0018]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the print head maintenance device concerning this invention The wiper section which performs wiping in slide contact with a print head, and the cap section which covers a print head and performs capping are formed in one by the elastic member. When the cartridge concerned carries out elastic deformation of the member concerned in contact with said elastic member at the time of migration of an ink cartridge, the variation rate of said wiper section and the cap section is carried out. While cleaning said print head in said wiper section, it constitutes so that said print head may be covered in said cap section.

[0019] If it does in this way, since the wiper section and the cap section will really be formed, the member for wiping and capping can be managed with one. Moreover, since wiping and capping are performed using the elastic deformation of an elastic member, the special device for driving the wiper section and the cap section becomes unnecessary.

[0020] Here, it has the leg prolonged to an abbreviation perpendicular direction to the migration direction of an ink cartridge, the wiper section is formed in this leg and opposite side, the cap section is formed between said legs and wiper sections, and by making an ink cartridge contact to the wiper section, an elastic member can be constituted so that an elastic member may bend at an abbreviation right angle near the root section of the leg and the cap section.

[0021] Moreover, the wiper section can be constituted so that it may consist of the 1st wiper section projected to the side to the leg, and the 1st [ this ] wiper section and the 2nd wiper section projected to the opposite direction, the cartridge concerned may be made to contact the 1st wiper section at the time of migration in the 1st direction of an ink cartridge and the cartridge concerned may be made to contact the 2nd wiper section at the time of migration in the 2nd direction of an ink cartridge.

[0022] Furthermore, it can constitute so that it may have the hollow where the cap section contains a print head.

[0023] Moreover, the point of the wiper section can be made into a knife-edge configuration.

[0024] Furthermore, an elastic member has the leg prolonged to an abbreviation perpendicular direction to the migration direction of an ink cartridge. The cap section of

a core box is formed in one succeeding this leg, and a perimeter is surrounded by the wall and is carrying out opening of said cap section to the upper part. It is formed as the wiper section to which the upper limit side of said wall \*\*\*\*s to a print head, and by making an ink cartridge contact to the cap section, it can constitute so that said leg may carry out elastic deformation.

[0025]

[Embodiment of the Invention] It explains referring to drawing about the desirable operation gestalt of this invention hereafter. Drawing 1 is the perspective view showing an example of the print head maintenance device concerning this invention. The print head maintenance device M consists of the wiper section 14 which performs wiping in slide contact with the print head of the ink cartridge mentioned later, the cap section 15 which covers a print head and performs capping, and the leg 16, and these wiper sections 14, the cap section 15, and the leg 16 are formed in one of the elastic members 8, such as rubber. Specifically, an elastic member 8 consists of a material like an elastomer. As shown in drawing 2, this elastic member 8 is formed in the interior of the base 9 of an ink jet printer 1 so that the wiper section 14 and cap section 15 grade may project upwards.

[0026] The leg 16 is prolonged to the abbreviation perpendicular direction to the migration direction (the direction of an arrow head of drawing 2) of an ink cartridge 4, the wiper section 14 is formed in this leg 16 and opposite side, and the cap section 15 is formed between the leg 16 and the wiper section 14.

[0027] The wiper section 14 is equipped with the 1st wiper section 141 projected to the side to the leg 16, and this 1st wiper section 141 and the 2nd wiper section 142 projected in the opposite direction, and the points 141a and 142a of each wiper section 141 and 142 are formed in the tapering knife-edge configuration.

[0028] While the hollow 19 which has the side attachment walls 17 and 18 of the pair which counters is formed in the cap section 15, the 1st wiper section 141 and the piece 20 of a protrusion which counters are formed in one across this hollow 19. The die length of this piece 20 of a protrusion is almost the same as the die length of the 1st wiper section 141, and is prolonged in parallel with the 1st wiper section 141.

[0029] The elastic member 8 which consists of the above structure has the notch 22 in the root section 21 of the cap section 15 and the leg 16, and is tending to bend [ come ] by elastic deformation near the root section 21.

[0030] Drawing 2 is an example of the ink jet printer using the elastic member 8 mentioned above as a print head maintenance device M, and has attached the same sign about the same part as drawing 8. Since the part except the print head maintenance device M is the same as that of drawing 8 among the structures of drawing 2, those detailed explanation is omitted.

[0031] In drawing 2, after print head 4a finishes printing to the printing side of a print sheet 3, a print sheet 3 is discharged out of a printer 1 with a delivery roller etc., and

with the synchronous belt 6 driven by the motor 7, the ink carriage 2 which laid the ink cartridge 4 is conveyed rightward [ of [drawing 2](#) ], and moves it to a home position.

[0032] Next, actuation of wiping in the migration process of this ink carriage 2 and capping is explained. [Drawing 3](#) is the mimetic diagram having shown the situation of wiping by the print head maintenance device M, and capping. In drawing, although the elastic member 8 is the same as the thing of [drawing 1](#) , it has drawn in the simple configuration where the notch 22 was omitted here. Moreover, the elastic member 8 is illustrated in the cross section for the facilities of an understanding.

[0033] The ink cartridge 4 which finished printing moves in the direction of an arrow head toward a home position, and [drawing 3](#) (a) shows the condition of having come to the location of an elastic member 8. If an ink cartridge 4 moves rightward further, print head 4a of an ink cartridge 4 will contact the 1st wiper section 141 of an elastic member 8, and in response to the thrust from this print head 4a to the right, elastic deformation of the elastic member 8 will be carried out like [drawing 3](#) (b) so that it may bend rightward in the root section 21 neighborhood. Since the elastic member 8 is formed with ingredients, such as rubber, at this time, it deforms so that the part of a hollow 19 may also curve a little (in [drawing 3](#) (b), this curve is exaggerated a little and it has drawn). In connection with deformation of an elastic member 8, the 1st wiper section 141 is also displaced in the direction of drawing Nakamigi.

[0034] If an ink cartridge 4 moves rightward further from this condition, like [drawing 3](#) (c), elastic deformation of it will be carried out until an elastic member 8 bends rightward at a right angle mostly from the root section 21 neighborhood, and print head 4a of an ink cartridge 4 will be contained by the hollow 19. At this time, print head 4a holds the condition of having been surrounded with the 1st wiper section 141, the piece 20 of a protrusion, and side attachment walls 17 and 18 (referring to [drawing 1](#) ). Thus, capping of the print head 4a is carried out by print head 4a of an ink cartridge 4 being contained by the hollow 19, and desiccation of the nozzle (illustration abbreviation) of print head 4a is prevented. In addition, [drawing 3](#) (c) is in the condition which has an ink cartridge 4 in a home-position location.

[0035] Next, if a printing command comes, as shown in [drawing 3](#) (d), an ink cartridge 4 will start migration toward the right further from a home-position location. Print head 4a of an ink cartridge 4 tends to overcome the 1st wiper section 141 with this migration. By this, elastic deformation of the elastic member 8 is carried out so that it may bend below further from the root section 21 neighborhood.

[0036] And if an ink cartridge 4 moves rightward further, as shown in [drawing 3](#) (e), in slide contact with the inferior surface of tongue (ink regurgitation side) of print head 4a, wiping will be performed for knife-edge-like point 141a of the 1st wiper section 141, and print head 4a will be cleaned.

[0037] And if an ink cartridge 4 moves rightward further and print head 4a overcomes the 1st wiper section 141, as shown in [drawing 3](#) (f), an elastic member 8 will return to



the original condition according to the elastic stability.

[0038] Then, an ink cartridge 4 reverses a direction and starts migration leftward. And if it moves to a location with an ink cartridge 4, as shown in drawing 3 (g), print head 4a of a cartridge 4 will contact the 2nd wiper section 142 of an elastic member 8.

[0039] If an ink cartridge 4 moves leftward still more, as shown in drawing 3 (h), in slide contact with the inferior surface of tongue of print head 4a, wiping will be performed for knife-edge-like point 142a of the 2nd wiper section 142, and print head 4a will be cleaned.

[0040] And if an ink cartridge 4 moves leftward further and print head 4a separates from the 2nd wiper section 142, as shown in drawing 3 (i), an elastic member 8 will return to the original condition according to the elastic stability. Then, an ink cartridge 4 moves leftward further, and is conveyed to a printing area, and predetermined printing actuation is performed.

[0041] According to the operation gestalt mentioned above, since the wiper section 14 and the cap section 15 are formed in one of the elastic member 8, wiping and capping can be performed by one member. Moreover, since the variation rate of the wiper section 14 accompanying the elastic deformation of an elastic member 8 and the cap section 15 is made to perform wiping and capping, it is not necessary to prepare a special cam mechanism like before etc.

[0042] Moreover, in the operation gestalt mentioned above, the leg 16 is formed in an elastic member 8, and since it was made for an elastic member 8 to bend at an abbreviation right angle near [ root section 21 ] the leg 16 and the cap section 15 by making an ink cartridge 4 contact to the wiper section 14, elastic deformation of the elastic member 8 can be carried out easily. Consequently, according to the elastic force of the vertical direction of an elastic member 8, while being able to perform actuation of wiping and capping smoothly, even if dispersion is in the physical relationship of an elastic member 8 and print head 4a, it becomes possible to absorb this and positive wiping and positive capping can be performed.

[0043] In the operation gestalt mentioned above the wiper section 14 Moreover, the 1st wiper section 141, It constitutes from this 1st wiper section 141 and the 2nd wiper section 142 projected in the opposite direction. Since the 1st wiper section 141 is made to contact a cartridge 4 at the time of migration to the right of an ink cartridge 4 and the 2nd wiper section 142 is made to contact a cartridge 4 at the time of migration leftward Wiping can be performed twice at the time of the printing initiation which an ink cartridge 4 comes out from a home position, and moves to a printing area, and the cleaning effectiveness of print head 4a doubles.

[0044] Furthermore, in the operation gestalt mentioned above, since it has the hollow 19 where the cap section 15 contains print head 4a, print head 4a covers completely by the hollow 19, is surrounded, and can prevent desiccation of print head 4a effectively.

[0045] Moreover, in the operation gestalt mentioned above, since the points 141a and

142a of the wiper sections 141 and 142 were made into the knife-edge configuration, it becomes easy to remove the affix of head 4a because this acute point \*\*\*\*s to print head 4a, and a wiping effect improves.

[0046] Drawing 4 is the perspective view showing other operation gestalten of the print head maintenance device concerning this invention. In drawing, 23 is the elastic member formed from the elastomer etc. as well as the above-mentioned elastic member 8, this elastic member 23 has one pair of legs 231 and 232 prolonged to an abbreviation perpendicular direction to the migration direction of an ink cartridge, and the cap section 24 of a core box is formed in one succeeding these legs 231 and 232. Said cap section 24 has the hollow 25 which the perimeter was surrounded by Walls 24a, 24b, 24c, and 24d, and carried out opening to the upper part.

[0047] Drawing 5 is a mimetic diagram explaining actuation of the print head maintenance device by the above-mentioned elastic member 23. As shown in drawing 5 (a), as for the top face of the cap section 24 of an elastic member 23, only some distance d is located up from the inferior surface of tongue of print head 4a of an ink cartridge 4.

[0048] If an ink cartridge 4 moves in the direction of drawing Nakamigi, print head 4a will contact wall 24a of the cap section 24. If an ink cartridge 4 moves rightward further after this, it is going to overcome this, while print head 4a contacts wall 24a, as shown in drawing 5 (b).

[0049] At this time, elastic deformation of one pair of legs 231 and 232 of the cap section 24 is carried out so that it may incline rightward, the top-face location of the cap section 24 falls a little by this, and they move print head 4a, \*\*\*\*ing to wall 24a. In this process, the upper limit side of print head 4a and wall 24a \*\*\*\*s, and wiping of print head 4a is performed. That is, the upper limit side of wall 24a serves as the wiper section which performs wiping in slide contact with print head 4a. In order to heighten this wiping effect, of course, it is also possible to make the upper limit side of wall 24a into a knife-edge configuration like a previous operation gestalt.

[0050] And if an ink cartridge 4 moves rightward further, as shown in drawing 5 (c), print head 4a will get into the hollow 25 of the cap section 24. At this time, the cap section 24 is displaced upwards a little according to the elastic stability of the legs 231 and 232. In this way, print head 4a is blockaded in a hollow 25, and capping is completed. This location is the home position of an ink cartridge 4.

[0051] In addition, although illustration is omitted, if a printing command comes after that, print head 4a of an ink cartridge 4 will come out from the hollow 25 of the cap section 24, and an ink cartridge 4 will be conveyed to a printing area. Also in this process, it functions as a wiper to which wall 24a of 24 performs wiping in slide contact with print head 4a.

[0052] Since an elastic member 23 is made to a simple configuration while according to the operation gestalt of drawing 4 covering print head 4a by the cap section 24 of a core box, surrounding and being able to do capping certainly, there is a merit that a

manufacturing cost can be pressed down low.

[0053] In addition, although each operation gestalt mentioned above is an example desirable when carrying out the print head maintenance device concerning this invention, it is not limited to seeing and this invention can adopt [ these ] various operation gestalten as others.

[0054] Drawing 6 is the example and forms the wiper section 27, the cap section 28, and the leg 29 in the tabular elastic member 26 at one. Point 27a of the wiper section 27 is made into the knife-edge configuration, and has heightened the wiping effect. Moreover, the wall 30 surrounding a four way type is formed in the cap section 28, in this wall 30, a part for the point of a print head is contained and capping is performed. Also according to such a print head maintenance device, by carrying out elastic deformation of the elastic member 26 so that it may bend near the boundary of the cap section 28 and the leg 29, the variation rate of the wiper section 27 and the cap section 28 can be carried out, and wiping and capping can be performed.

[0055] Drawing 7 is other examples, they is replaced with the wall 30 in drawing 6 , forms a hollow 31, and contains a part for the point of a print head to this hollow 31. Since other parts are the same as that of drawing 6 , the same sign is given to the same part and detailed explanation is omitted.

[0056] In addition, as an ingredient of the elastic member in this invention, the resin which was rich in elasticity besides rubber can be used. Moreover, the printer by which the print head maintenance device mentioned above is applied is not limited to the structure shown in drawing 2 , and can apply this invention to various ink jet printers.

[0057]

[Effect of the Invention] According to this invention, since the wiper section and the cap section were formed in one by the elastic member, wiping and capping can be performed by one member, components mark are lessened, and cost can be reduced. Moreover, since it was made to perform wiping and capping by carrying out elastic deformation of the elastic member, and carrying out the variation rate of the wiper section and the cap section, it is effective in that become unnecessary, structure becomes easy and the cam mechanism for driving the wiper section like before and the cap section etc. can miniaturize equipment.

[0058] Moreover, the leg is formed in an elastic member, by having made it an elastic member bend at an abbreviation right angle near the root section of the leg and the cap section by contact of an ink cartridge, elastic deformation of the elastic member can be carried out easily, and actuation of wiping and capping can be performed smoothly. Furthermore, since this is absorbable with the elasticity of an elastic member even if dispersion is in the physical relationship of an elastic member and a print head, it becomes possible to perform positive wiping and positive capping.

[0059] Moreover, with constituting the wiper section from the 1st wiper section, and this 1st wiper section and the 2nd wiper section projected in the opposite direction,

wiping can be performed twice at the time of printing initiation, and the cleaning effectiveness of a print head doubles.

[0060] Moreover, by establishing the hollow which contains a print head in the cap section, a print head can be completely covered by the hollow, and can be surrounded, and desiccation of a print head can be prevented effectively.

[0061] Furthermore, by making the point of the wiper section into a knife-edge configuration, it becomes easy to remove the affix of a print head, and a wiping effect improves further.

[0062] Moreover, by making the leg and the cap section of the core box which follows this leg into the structure formed in one by the elastic member, while being able to carry out capping of the print head certainly by the cap section of a core box, the configuration of an elastic member can be simplified and a manufacturing cost can be reduced.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the operation gestalt of the print head maintenance device concerning this invention.

[Drawing 2] It is the important section perspective view of the ink jet printer using the print head maintenance device of drawing 1.

[Drawing 3] It is a mimetic diagram explaining the actuation of wiping of a print head maintenance device, and capping concerning this invention.

[Drawing 4] It is the perspective view showing other operation gestalten of the print head maintenance device concerning this invention.

[Drawing 5] It is a mimetic diagram explaining actuation of the print head maintenance device of drawing 4.

[Drawing 6] It is the perspective view showing other operation gestalten of the print head maintenance device concerning this invention.

[Drawing 7] It is the perspective view showing other operation gestalten of the print head maintenance device concerning this invention.

[Drawing 8] It is the important section perspective view of the ink jet printer equipped with the conventional print head maintenance device.

[Drawing 9] It is the perspective view of the wiper in the conventional print head maintenance device.

[Drawing 10] It is the perspective view of the cap section in the conventional print head maintenance device.

[Drawing 11] It is a mimetic diagram explaining actuation of wiping in the conventional

print head maintenance device, and capping.

[Description of Notations]

1 Ink Jet Printer

2 Ink Carriage

3 Print Sheet

4 Ink Cartridge

4a Print head

8 Elastic Member

14 Wiper Section

15 Cap Section

16 Leg

23 Elastic Member

24 Cap Section

26 Elastic Member

27 Wiper Section

28 Cap Section

29 Leg

M Print head maintenance device